

HELPING BLIND PEOPLE TO SEE

by Anna Grayson

A team of German doctors has tested a way of enabling blind people to see.

As part of a [clinical](#) trial, 11 patients had a special eye operation. All were suffering from a disease, or condition, called *retinitis pigmentosa* (often called RP). It usually starts when people are very young. As they get older it becomes gradually worse. Eventually they become blind. RP is an inherited disease, so it can run in families.

During the operation all the patients had a special microchip implanted behind one of their eyes. Within a few days three of them were able to see shapes and objects. One patient was even able to tell the time from a clock, and when looking at his name written down, corrected the spelling.

In a healthy eye, light enters through the cornea and the lens. It then passes through the main part of the eye, called the vitreous humour. The light forms an image on a thin layer, or lining, at the back of the eyeball, called the retina. The retina is rather like a very small cinema screen. It is made of light-sensitive cells called photoreceptors. These cells send messages to the brain through the optic nerve. The brain is then able to create a "picture" of what the eye can see.

The photoreceptor cells of people who have RP gradually die off. This means that their retinas can no longer "see", or detect light. Messages are no longer sent to their brains along the optic nerve. The disease doesn't damage the front part of the eye or the optic nerve. So the microchips used in the operation were designed to replace some of the patients' dead photoreceptor cells.

Other devices used to help blind people to see have been made in the past. Yet for these to work, a blind person has to wear an external camera

connected to a small computer processor unit. The new microchips are very different, because they use all the healthy parts of the eye. Light travels to the retina as normal, and the image passes from the chip straight down the optic nerve.

Each microchip does need a small battery. This was placed at the back of the skull and connected to the "chip" with a thin wire.

When the chips were turned on, the patients could not see immediately. This was because their brains had to re-learn how to decode the images

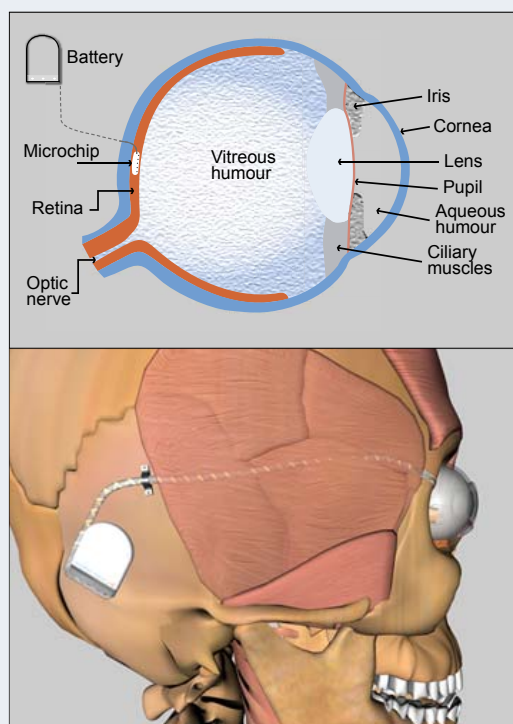
sent by the chip. Miikka Terho, one of the patients, said "they told me that I should see dots in my eye, like light bulbs. I was a bit nervous and shaky, because nobody really knew how successful it was going to be, but when they hit the button and I could see the dots, I shouted out "yes" at the top of my voice!"

Mr. Terho went on to recognize objects, such as a banana, and he could distinguish between a knife, a fork and a spoon. Most impressively, he could recognize the outlines of people and could see arm movements from 20 feet (six meters) away.

This test was a clinical trial, which took place in a laboratory. Mr. Terho and the other

patients have therefore not been able to turn on the chips at home yet. Another clinical trial will be done in Britain next year. Doctors will carry out more research to test how long the chip will last. They also want to see if they can improve the chips to create a better image.

The Royal Society, one of the world's leading academies of science, based in Britain, says that the German trial is an [unprecedented](#) advance. It could eventually cure the blindness of around 200,000 people around the world who have RP.



The new microchip is put just behind the retina. A fine wire links it to a battery on the back of the skull